USER'S MANUAL

PC-586HVE-S

586/6x86
Pentium Embedded Card
W/ VGA & Flat Panel, LAN

PC-586HVE-S-M1

PC-586HVE-S PENTIUM CPU CARD
WITH VGA & LAN

OPERATION MANUAL

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This operation manual is meant to assist both Embedded Computer manufacturers and end users in installing and setting up the system. The information contained in this document is subject to change without any notice.

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INTRODUCTION

CHAPTER

1

This chapter gives you the information for PC-586HVE-S. It also outlines the system specifications.

Sections includes:

- About This Manual
- System Specifications
- Safety precautions

Experienced users can skip to chapter 2 on page 2-1 for Quick Start.

1-1. ABOUT THIS MANUAL

Thank you for purchasing our PC-586HVE-S Pentium Embedded CPU Card with VGA & LAN, fully PC / AT compatible. The PC-586HVE-S provides faster processing speed, greater expandability and can handle more task than before. This manual is designed to assist you on how to install and set up the system. It contains five chapters. The user can apply this manual for configuration according to the following chapters :

Chapter 1 Introduction

This chapter introduces you to the background of this manual, and the specification for this system. The final of this chapter will indicate you on how to avoid damages for this Embedded CPU Card.

Chapter 2 Hardware Configuration

This chapter outlines the component locations and their functions. In the end of this chapter, you will learn how to set the jumpers and how to configure this card to meet your own needs.

Chapter 3 Software Utilities

The chapter contains helpful information that informs you the proper installation of the VGA driver, LAN driver, and Flash BIOS. It also describes the Watchdog-timer configuration.

Chapter 4 Green PC Function

This chapter explains the Green PC functions concisely.

Chapter 5 Award BIOS Setup

This chapter indicates how to set up the BIOS configurations.

Appendix A Expansion Bus

This Appendix introduces you the expansion bus for PCI BUS.

Appendix B Technical Summary

This section gives you the information about the Technical maps.

Appendix C Trouble Shooting

This section outlines the error messages and offers you the methods on how to solve the problems.

1-2. SYSTEM SPECIFICATIONS

- **CPU :**
  Intel
  Pentium MMX.
  320/321 pin PGA socket.
  233 MHz clock generator.
  2.8V voltage regulator.

- **MEMORY :**
  Up to 128MB, EDO/FPM DRAM
  Two 72pin SIMM sockets on board.

- **CACHE :**
  L1 Cache (depended on CPU type).
  L2 Cache on board 512K.

- **REAL-TIME CLOCK :**
  CMOS data back up from BIOS set or BIOS default.
  Dallas DS 12887 Real Time Clock.

- **BIOS :**
  Award, Flash BIOS for plug & play function.
  Easy update 128/256 KB flash EEPROM.
  Support Green Function .
  Support S/IO Setup.

- **KEYBOARD CONNECTOR :**
  PC/AT type mini DIN connector.
  Support PC/AT Keyboard or PS/2 Mouse by jumper selection.
  5 pin External keyboard connector.

- **BUS SUPPORT :**
  External PCI BUS.
  Internal PCI Bus, for VGA & IDE.

- **DISPLAY :**
  Support SVGA for CRT & Panel.
  Support 32bits PCI Local Bus.
  VGA BIOS combines in 128/256KB flash ROM together with system BIOS.
  Support 15 pin connector 1024 x 768 (256 colors) resolution on SVGA Monitor.
  Support 2 MB Video memory.
  Support 41 pin connector 800 x 600 & 1024 x 768 resolutions on LCD Panel.
  Panel support Mono, Color STN, TFT, EL.
  SVGA & Panel Display simultaneously.

- **WATCHDOG :**
  I / O port 443H to open watchdog.
  I / O port 441H to close watchdog.
  Time-out timing select 0 / 8 / 16 / 24 / 32 / 40 / 48 / 56 / 64 / 72 / 80 / 88 / 96 / 104 / 112 / 120 sec +/- 25%.

- **IDE INTERFACE :**
  One IDE channel, support up to two Enhanced IDE devices.

- **LAN INTERFACE :**
  Intel 82559 Fast Ethernet
  10/100 Base-T PCI-BUS

- **FLOPPY DISK DRIVER INTERFACE :**
  Support up to two Floppy Disk Drivers, 3.5" and 5.25" (360K / 720K / 1.2M / 1.44M / 2.88M).

- **SERIAL PORT :**
  Two high speed 16550 Compatible UARTs with Send / Receive 16 Byte FIFOs.
  MIDI Compatible.
  Programmable Band Rate Generator.

- **PARALLEL PORT :**
  SPP, ECP, EPP Function.
  Bi-directional parallel port.

- **GREEN FUNCTION :**
  Software support by BIOS setup.
  Hardware support by switch control.

- **LED INDICATOR :**
  System power.
  Hard Disk access.
  Turbo function mode.
  LAN Led indicator.

- **DMA CONTROLLER :**
  82C37 x 2

- **DMA CHANNELS :**
  7

- **INTERRUPT CONTROLLERS :**
  82C59 x 2

- **INTERRUPT LEVELS :**
  15

- **STORAGE TEMPERATURE :**
  -40 to 80°C.

- **OPERATING TEMPERATURE :**
  0 to 60°C.

- **SYSTEM POWER REQUIREMENT :**
  DC Voltage: +5V, minimum +4.75V, maximum +5.25V.
  DC Ampere: 15A.
  DC Voltage: +12V, minimum +11.4V, maximum +12.6V.
  DC Ampere: 500mA.

- **BOARD DIMENSION :**
  7.2"(L) x 4.8"(W) (185mm x 122mm)

- **BOARD WEIGHT :**
  0.25 Kg.

1-3. SAFETY PRECAUTIONS

Follow the messages below to avoid damaging the system :

1. Avoid your system from static electricity on all occasions.

2. Stay safe from the electric shock. Don't touch any components of this card when the card is on. Always disconnect power when the system is not in use.

3. Disconnect power when you change any hardware devices. For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

HARDWARE CONFIGURATION

CHAPTER

2

*** QUICK START ***

Helpful information which details you the jumper & connector settings, and component locations.

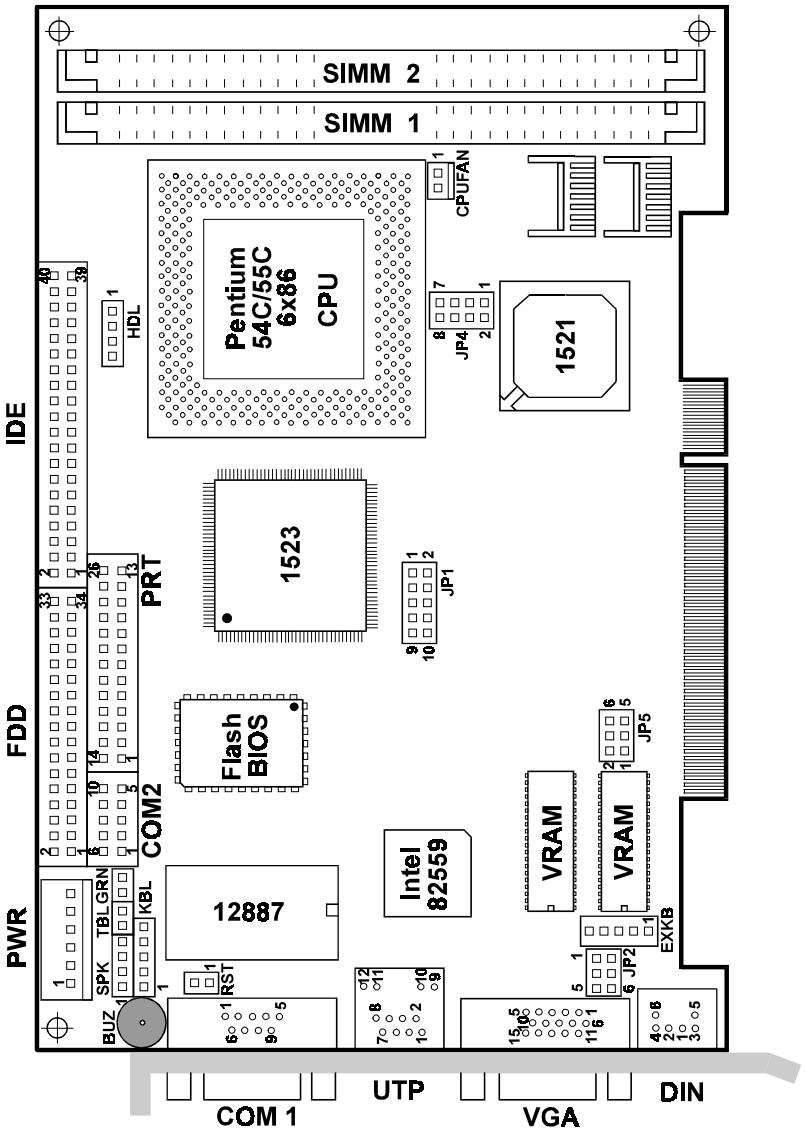
Sections include:

- Jumper & Connector Quick Reference Table
- Component Locations
- Configuration and Jumper settings
- Connector Pin Assignments

2-1. JUMPER & CONNECTOR QUICK REFERENCE TABLE

CPU Voltage Selection	JP4
Bus Frequency Ratio Selection	JP1 (1-6)
CPU Clock Selection	JP1 (7-10)
COM Connector	COM1, COM2
Keybaord or PS/2 Mouse Selection	JP2
DIN Connector	DIN
External Keyboard Connector	EXKB
Green Function Connector	GRN
Floppy Disk Drive Connector	FDD
Hard Disk Drive LED Connector	HDL
Hard Disk Drive Connector	IDE
Power LED & KeyLock Connector	KBL
CRT Connector	VGA
Power Connector	PWR
CPU FAN Connector	CPUFAN
Printer Connector	PRT
Reset Connector	RST
External Speaker Connector	SPK
Turbo LED Connector	TBL
LAN Connector	UTP
VRAM Power Selection	JP5
Memory Installation	SIMM1, SIMM2

2-2. COMPONENT LOCATIONS



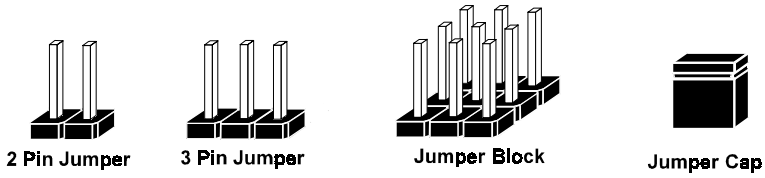
PCI-586HVE-S Connectors, Jumpers, and Component locations

2-3. HOW TO SET THE JUMPERS

You can configure your board by setting the jumpers. A jumper consists of two or three metal pins with a plastic base mounted on the card, and a small plastic "cap"(with a metal contact inside) to connect the pins. So you can set up your hardware configuration by "open" or "close" the pins.

The jumper can be combined into sets which called jumper blocks. When the jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows how this looks.

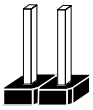
JUMPERS AND CAPS



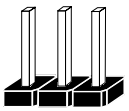
If a jumper has three pins, for example, labelled PIN1, PIN2, and PIN3. You can connect PIN1 & PIN2 to create one setting and shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams look and what they represent.

JUMPER DIAGRAMS

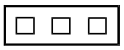
Jumper Cap looks like this

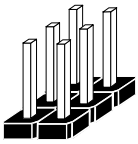


2 pin Jumper looks like this

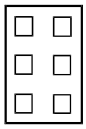


3 pin Jumper looks like this



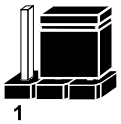


Jumper Block looks like this

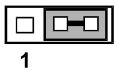


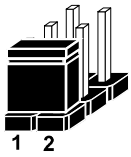
JUMPER SETTINGS

2 pin Jumper closed(enabled)
looks like this

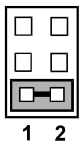


3 pin Jumper
2-3 pin closed(enabled)
looks like this





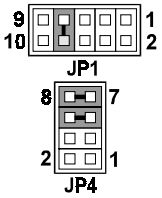
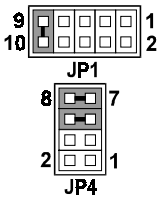
Jumper Block
1-2 pin closed(enabled)
looks like this



2-4. CPU TYPE & CPU CLOCK SELECTION

JP4 : I/O Voltage Selection
JP1 (1-6) : CPU Clock Selection
JP1 (7-10) : Bus Frequency Ratio Selection
The jumper settings are as follows:

2-4-1 Intel MMX-200/233 CPU type & clock Jumper Setting

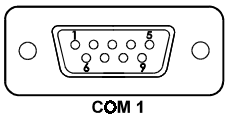
CPU TYPE	CPU CLOCK	Jumper settings (pins closed) JP1	JP4	Jumper Illustration
Intel Pentium MMX 200MHz	60MHz	7-8	5-6 7-8	
Intel Pentium MMX 233MHz	66Mhz	9-10	5-6 7-8	

2-5. COM CONNECTOR

Two COM port is enhanced with this board, namely the COM1 and COM2.

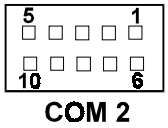
COM1 : COM1 Connector, DB9 male connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI



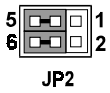
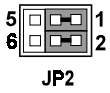
COM2 : COM2 Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI
10	NC



2-6. KEYBOARD OR PS/2 MOUSE SELECTION

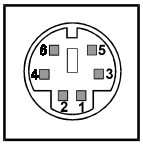
JP2 : AT Keyboard or PS/2 Mouse Selection.
The jumper settings are as follows:

DEVICE TYPE	Jumper Settings (pins closed) JP2	Jumper Illustration
AT KEYBOARD	3-5 4-6	
PS/2 MOUSE	1-3 2-4	

2-7. DIN CONNECTOR

DIN : Mini DIN Connector
This connector can support PC/AT Keyboard or PS/2 Mouse, the user must select the right device type as illustrated in JP2.
The pin assignments are as follows:

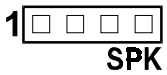
PIN	ASSIGNMENT	
	KEYBOARD	**PS/2 MOUSE**
1	KBDATA	MSDATA
2	NC	NC
3	GND	GND
4	VCC	VCC
5	KBCLK	MSCLK
6	NC	NC



2-8. EXTERNAL SPEAKER CONNECTOR

SPK : External Speaker Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	VCC
2	Speaker Signal
3	Speaker Signal
4	Speaker Signal



2-9. TURBO LED CONNECTOR

TBL : Turbo LED Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	VCC
2	Turbo Signal

2-10. GREEN FUNCTION CONNECTOR

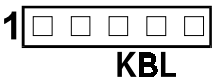
GRN : Green Function Connector.
The pin assignments are as follows:

PIN	ASSIGNMENT
1	Green Signal
2	Ground

2-11. POWER LED & KEYLOCK CONNECTOR

KBL : Power LED & Keylock Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	Power LED
2	NC
3	Ground
4	Keyboard INT
5	Ground



2-12. LAN LED CONNECTOR

JP7 : LAN Led Connector
This LAN Led Connector is used to detect 10/100mbps.
The pin assignments are as follows:

PIN	ASSIGNMENT
1	Pull Hi
2	LED

2-13. RESET CONNECTOR

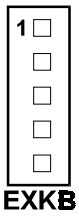
RST : Reset Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	Reset
2	Ground

2-14. EXTERNAL KEYBOARD CONNECTOR

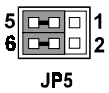
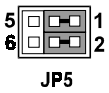
EXKB : External Keyboard Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	KBCLK
2	KBDATA
3	NC
4	GND
5	VCC



2-15. VRAM VOLTAGE SELECTION

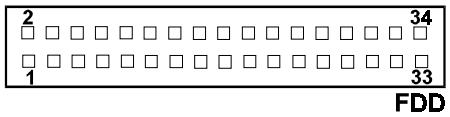
JP5 : VGA Voltage Selection.
The jumper settings are as follows:

VOLTAGE	Jumper Settings (pins closed) JP5	Jumper Illustration
VCC	1-3 2-4	
VCC3	3-5 4-6	

***Manufactory default --- VCC.

2-16. FLOPPY DISK DRIVE CONNECTOR

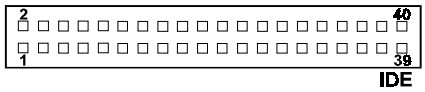
FDD : Floppy Disk Drive Connector
You can use a 34-pin daisy-chain cable to connect two-FDDs. On one end of this cable is a 34-pin flat cable to attach the FDD connector on the board, the other side is attaches to two FDDs.
The pin assignments are as follows:



PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	2	RPM
3	GND	4	NC
5	GND	6	RATE0
7	GND	8	INDEX
9	GND	10	MTR0
11	GND	12	DRV1
13	GND	14	DRV0
15	GND	16	MTR1
17	GND	18	DIR
19	GND	20	STEP
21	GND	22	WDATA
23	GND	24	WGATE
25	GND	26	TRK0
27	GND	28	WRPRT
29	GND	30	RDATA
31	GND	32	SEL
33	GND	34	DSKCHG

2-17. HARD DISK DRIVE CONNECTOR

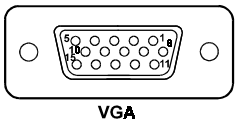
IDE: Hard Disk Drive Connector
The pin assignments are as follows:



PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	IDERST	21	IDEREQ0
2	GND	22	GND
3	IDED7	23	IDEIOW
4	IDED8	24	GND
5	IDED6	25	IDEIOR
6	IDED9	26	GND
7	IDED5	27	IDERDY
8	IDED10	28	PULL HI
9	IDED4	29	IDEACK0
10	IDED11	30	GND
11	IDED3	31	IRQ14
12	IDED12	32	IOCS16
13	IDED2	33	IDEA1
14	IDED13	34	GND
15	IDED1	35	IDEA0
16	IDED14	36	IDEA2
17	IDED0	37	IDECS1P
18	IDED15	38	IDECS3P
19	GND	39	IDELEDP
20	N.C.	40	GND

2-18. VGA CRT CONNECTOR

VGA : VGA CRT Connector
The pin assignments are as follows:

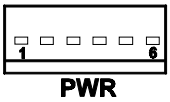


PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	RED	9	NC
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	NC
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	NC
8	GND		

2-19. POWER CONNECTOR

PWR : Power Connector
The pin assignments are as follows:

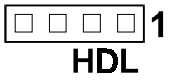
PIN	ASSIGNMENT
1	NC
2	+5V
3	+12V
4	-12V
5	GND
6	GND



2-20. HARD DISK DRIVE LED CONNECTOR

HDL : Hard Disk Driver LED Connector
The pin assignments are as follows:

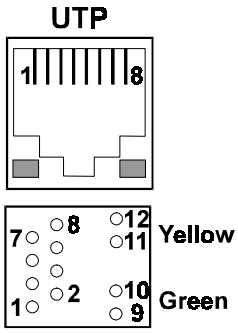
PIN	ASSIGNMENT
1	VCC
2	HDD Active Signal
3	HDD Active Signal
4	HDD Active Signal



2-21. UTP CONNECTOR

UTP: LAN Connector
There are two LAN LED indicators found in UTP socket, namely: the yellow led and green led. Yellow led indicator is used to detect data transfer, while Green led indicator is used to detect power link.
The pin assignments are as follows:

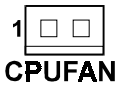
PIN	ASSIGNMENT
1	TX+
2	TX-
3	RX+
4	ISOLATED GND
5	ISOLATED GND
6	RX-
7	ISOLATED GND
8	ISOLATED GND
9	LED - Green
10	Pull Hi
11	LED - Yellow
12	Pull Hi



2-22. CPU FAN CONNECTOR

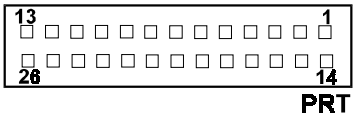
CPUFAN : CPU Fan Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	GND
2	VCC



2-23. PRINTER CONNECTOR

PRT : Printer Connector
As to link the Printer to the card, you need a cable to connect both DB25 connector and parallel port. The pin assignments are as follows:



PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	STB	14	AUTFE
2	P0	15	ERROR
3	P1	16	INIT
4	P2	17	SLCTIN
5	P3	18	GND
6	P4	19	GND
7	P5	20	GND
8	P6	21	GND
9	P7	22	GND
10	ACK	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	NC

2-24. MEMORY INSTALLATION

There are two 72 pins SIMM sockets on board.

Note: SIMM 1, 2 for single & double Bank DRAM module (72pin x 36bit x 2)

DRAM BANK CONFIGURATION

SIMM 1	SIMM 2	TOTAL MEMORY
8M		8M
8M	8M	16M
16M		16M
16M	16M	32M
32M		32M
32M	32M	64M
64M		64M
64M	64M	128M

SOFTWARE UTILITIES

CHAPTER
3

This chapter comprises the detailed information of VGA and Watchdog function; also describe how to install the configurations.

Sections include:

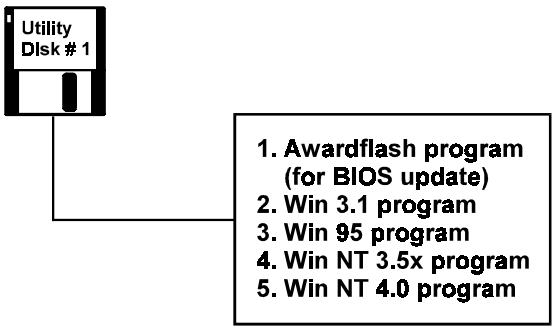
- VGA Driver Utility
- Flash BIOS Update
- LAN Driver Utility
- Watchdog Timer Configuration

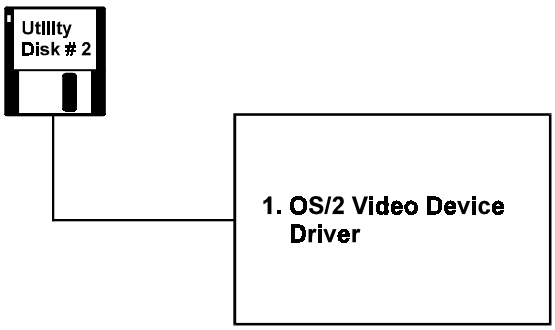
3-1. VGA DRIVER UTILITY

3-1-1. Introduction

The VGA interface for PC-586HVE-S Pentium CPU Card can support a great range of displays, such as SVGA, STN, TFT, EL.....etc. You can display CRT and LCD Panel simultaneously on this board, but make sure the modes for both CRT and LCD Panel must be the same. If not, only the CRT can be displayed.

This package enclosed two Utility Disk. It contains the following files:





Before you change any setup for VGA and system BIOS, you have to install your utility disk first, then the file will self-decompress and create sub-directory on your hard driver.

3-1-2. Installation of VGA Driver for PCI

1. Install VGA Driver to Windows 3.1

(1) To install VGA driver to Windows 3.1 is very easy, just insert the Utility Disk #1 into floppy disk Drive A/B under your Windows 3.1 system, and go to directory of Win31, where VGA driver is located.

(2) Click Setup.exe file for VGA driver installation directly. Follow the instructions on the screen to complete the installation.

(3) Once installation is completed, please shut down the system and restart in order for changes to take effect.

2. Install VGA Driver to Windows 95

(1) Click the START button first, and go to the control Panel.

(2) On Control Panel, click the DISPLAY icon and enter the SETTINGS tab of the DISPLAY PROPERTIES window.

3. Install VGA driver to Windows NT 3.5x/4.0

(1) To install VGA drivers to Windows 3.5x/4.0 is normally you would do.

(2) Enter the CONTROL PANEL of the operation system and go to the SETTINGS window of the DISPLAY PROPERTIES.

(3) Click on the CHANGE DISPLAY type and follow the instructions appear on the screen until you complete the whole installation.

(4) Once installation is completed, the system must be shut down and restart.

4. Install VGA driver to OS/2 Warp Operation System

(1) Preliminary Steps:

-- OS/2 DOS Support must be install.

-- If you previously installed SVGA support, you must reset the system to VGA mode. VGA is the default video mode enable when OS/2 is to be installed.

-- To restore VGA mode, Use SELECTIVE INSTALL and select VGA for PRIMARY DISPLAY. For more information on this procedure, see the section on

Changing Display Adapter Support in the OS/2 Users Guide.

(2) Start Driver installation from Utility Disk#2

(2.1) Open an OS/2 full screen or windowed session.

(2.2) Place into Drive A/B the Utility Disk#2, which contains the 65550 Display Driver.

(2.3) At the OS/2 command prompt , type the following commands to copy the files to OS/2 drive:
Type A: and press ENTER to make this default drive.
Type Setup A: C: and press ENTER.

⌛ When the setup Program is completed, you need to perform a shut down and restart the system in order for the changes to take effect.

(2.4) After restarting the system, first open the OS/2 System folder.

(2.5) Then open the System Setup folder.

(2.6) Open the Display Driver Install Object.

(2.7) When the Display Driver Install window appears, select PRIMARY DISPLAY, and click OK.

(2.8) When the Primary Display Driver List window appears, select "Chips and Technologies 65550/554" from the list of Adapter types, then select OK to install the video driver.

(2.9) When installation is completed, you should shut down and restart the system for the changes to take effect. Make sure to remove the Utility Disk #2 before restarting the system.

3-2. FLASH BIOS UPDATE

3-2-1. System BIOS Update :

Users can use the program "AWDFLASH.EXE" to update your VGA and System BIOS. This file is found in VGA Utility Disk # 1.

3-2-2. To update VGA BIOS for LCD Flat Panel Display :

As a user, you have to update the VGA BIOS for your specific LCD flat panel you are going to use. In doing this, you need two files. One is the "Awdflash.exe" file and the other is the VGA BIOS C&T 65550 file for LCD panel display. Both files should be provided by the vendor or manufacturer. If you have these files ready, follow the following steps for updating your VGA BIOS.

1. Install "Awdflash.exe" from Utility Disk # 1 to Drive C.

2. Insert into a suitable drive the VGA BIOS file you have obtained from the vendor or manufacturer.

3. Type the path to "Awdflash.exe" and execute the VGA BIOS update with file 586xxxxx.bin
   C:\UTIL\AWDFLASH>AWDFLASH 586xxxxx.bin

4. The screen will display the table below:

FLASH MEMORY WRITER v7.xx Copyright (C) 1996, Award Software, Inc.,
For ALI-1521/1523-2A5KFP6HC-0 DATE : 01/15/99 Flash Type - File Name to Program : FILENAME.BIN
Error Message : Do You Want To Save BIOS (Y/N)

If you want to save the original BIOS, enter “Y ”and press < Enter >. If you choose “N”, the following table will appear on screen.

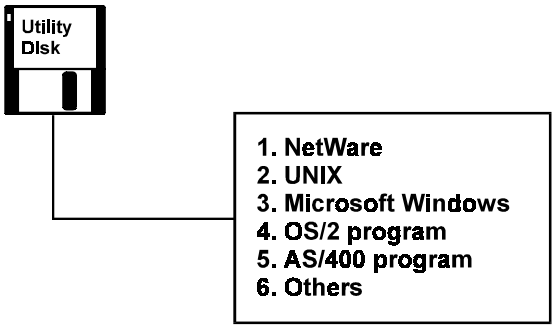
FLASH MEMORY WRITER v7.xx Copyright (C) 1996, Award Software, Inc.,
For ALI-1521/1523-2A5KFP6HC-0 DATE : 01/15/99 Flash Type - File Name to Program : FILENAME.BIN
Error Message : Are You Sure To Program (Y/N)

Select “Y”, and the BIOS will be renewed. When you are refreshing your BIOS, do not turn off nor reset the system or you will damage the BIOS. After you have completed all the programming, you will see the line: “Programming Flash Memory - ok”. Please power off or reset the system. Then the Flash BIOS is fully implemented.

3-3. LAN DRIVER UTILITY

3-3-1. Introduction

PC-586HVE-S embedded with LAN function can support various network adapters. Installation programs for Intel 82559 LAN driver is provided in one disk. The disk contains a self extracting file " 100PDISK.exe", copy the file into your hard disk and extract the file.



3-3-2. Installation Tips

Detailed information for installation is found in the following text files:

Microsoft Windows	MX.TXT
Novell NetWare	NETWARE.TXT
Unix	UNIX.TXT
Other Operating Systems	OTHER.TXT

Use any standard text editor or word processor to read, search, or print the files. These files are also viewable with the DOS text viewer in Setup. To use the viewer, type: SETUP /README at the DOS prompt.

3-4. WATCHDOG TIMER CONFIGURATION

The watchdog timer can reset the system automatically. It is defined at I/O port **443H**. When you want to enable the watchdog timer, please write I/O port **443H**, then the system will reset itself. When you want to disable the function, write I/O port **441H**, the system will run the command to stop the Watchdog function.

The PC-586HVE-S watchdog function, You must write your program so when it writes I/O port address 443 for enable watchdog and write I/O port address 441 for disable watchdog. The timer's intervals have a tolerance of 25% so you should program an instruction that will refresh the timer about every second.

The following program shows you on how to program the watch timer in your program.

Watchdog enable program:

```
MOV     AX, 000FH     (choose the values you need; start from 0)
MOV     DX, 443H
OUT     DX, AX
```

Watchdog disable program:

```
MOV     AX, 000FH     (this value can be ignored)
MOV     DX, 441H
OUT     DX, AX
```

The Watchdog Timer control table is as follows:

Level	Value	Time/sec	Level	Value	Time/sec
1	F	0	9	7	64
2	E	8	10	6	72
3	D	16	11	5	80
4	C	24	12	4	88
5	B	32	13	3	96
6	A	40	14	2	104
7	9	48	15	1	112
8	8	56	16	0	120

GREEN PC FUNCTION

CHAPTER

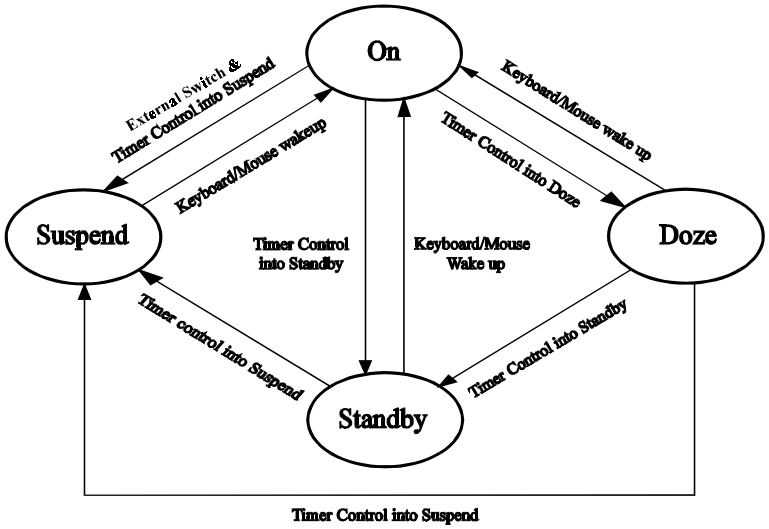
4

This chapter gives you the concise information for Green PC Function.

Sections include:

- Power Saving Block Diagram
- CPU Doze Mode
- System STANDBY Mode
- System SUSPEND Mode

4-1. POWER SAVING BLOCK DIAGRAM



4-2. CPU DOZE MODE

1. After out of the timer, CPU clock is slow down to 8MHz.
2. One beep sound.
3. Flash LED to indicate power saving status.
4. Monitor Activity, according to the setting of Advanced Setup.
5. Any activity occurs, system will exit from Doze mode to On mode.

4-3. SYSTEM STANDBY MODE

1. After out of the timer, CPU clock is slow down to 8MHz.
2. Two beep sound.
3. Flash LED to indicate power saving status.
4. Level 1 cache are disabled.
5. VGA monitor displays blank screen.
6. Fixed disk driver motor will be spin off.
7. Any activity occurs, system will exit from Standby mode to On mode.

4-4. SYSTEM SUSPEND MODE

1. After out of the timer, CPU clock is slow down to 8MHz, if you use Intel, Pentium or Cyrix (SMI) CPU, then CPU clock will be stopped.
2. Three beep sound.
3. Flash LED to indicate power saving status.
4. Level 2 cache are disabled.
5. VGA monitor displays blank screen.
6. Fixed disk driver motor will be spin off.
7. Monitor activity according to the setting of Advanced Setup.
8. When system in Suspend mode, only Keyboard / Mouse / Alarm resume can wakeup system.

AWARD BIOS SETUP

CHAPTER

5

This chapter states out how to set up the Award BIOS.

Section includes:

- Introduction
- Entering Setup
- The Standard CMOS Setup
- The BIOS Features Setup
- The Chipset Features Setup
- Power Management Setup
- PNP/PCI Configuration
- Load BIOS Defaults
- Integrated Peripherals
- IDE HDD Auto Detection
- Save and Exit Setup

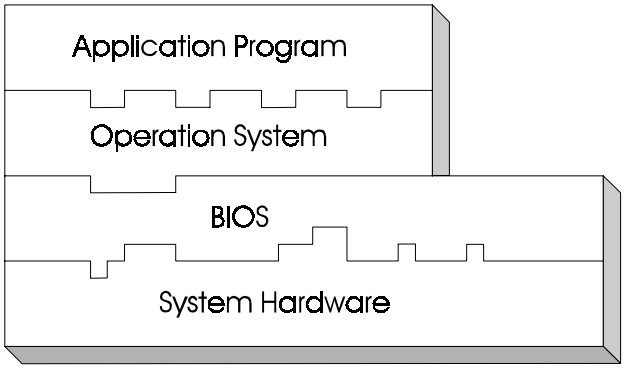
5-1. INTRODUCTION

This chapter will show you the function of a BIOS in managing the features of your system. The PC-586HVE-S Pentium Embedded Card is equipped with the BIOS for system chipset from Award Software Inc. This page briefly explains the function of a BIOS in managing the special features of your system. The following pages describe how to use the BIOS for system chipset Setup menu.

Your application programs (such as word processing, spreadsheets, and games) rely on an operating system such as DOS or OS/2 to manage such things as keyboard, monitor, disk drives, and memory.

The operating system relies on a BIOS (Basic Input and Output system), a program stored on a ROM (Read-only Memory) chip, to initialize and configure your computer's hardware. As the interface between the hardware and the operating system, the BIOS enables you to make basic changes to your system's hardware without having to write a new operating system.

The following diagram illustrates the interlocking relationships between the system hardware, BIOS, operating system, and application program:



5-2 ENTERING SETUP

Power on the computer and press < Del > immediately will allow you to enter Setup. The other way to enter Setup is to power on the computer, when the below message appears briefly at the bottom of the screen during the POST (Power On Self Test), press < Del > key or simultaneously press <Ctrl>, < Alt >, and < Esc > keys.

TO ENTER SETUP BEFORE BOOT PRESS <CTRL-ALT-ESC> OR <DEL> KEY

As long as this message is present on the screen you may press the <Del> key (the one that shares the decimal point at bottom of the number keypad) to access the Setup program. In a moment, the main menu of the Award SETUP program will appear on the screen:

ROM / PCI / ISA BIOS (2A5KFP6H) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
Esc : Quit F10 : Save & Exit Setup	↑↓→← :SELECT ITEM (Shift)F2 : Change Color
Time, Date, Hard Disk Type.....	

Setup program initial screen

You may use the cursor up/down keys to highlight the individual menu items. As you highlight each item, a brief description of that item's function appears in the lower window. If you have a color monitor you can use the Shift F2 keys to scroll through the various color combinations available.

5-3 THE STANDARD CMOS SETUP MENU

Highlight STANDARD CMOS SETUP and press < ENTER > and the screen will display the following table:

```
                    ROM PCI / ISA BIOS (2A5KFP6H)
                    STANDARD CMOS SETUP
                    AWARD SOFTWARE, INC.

Date (mm:dd:yy)    :  Sat,  July  30  1999
Time (hh:mm:ss)    :   2  :  4  :  10

                    CYLS  HEADS  PRECOMP  LANDZONE  SECTORS  MODE
Drive C  : Auto (  0Mb)    0      0        0         0        AUTO
Drive D  : Auto (  0Mb)    0      0        0         0        AUTO

Drive A : 1.44M , 3.5 in.                  Base Memory:     640K
Drive B : None                           Extended Memory:  64512K
                                           Other Memory:     384K
Video   : EGA/VGA                        ------------------------
                                           Total Memory:   65536K
Halt On: All Errors

 Esc : Quit          ↑↓→← :Select Item      Pu/Pd/+/- : Modify
 F1  : Help          (Shift) F2 : Change Color
```

CMOS setup screen

In the above table the base memory size and the extended memory size are displayed. This is automatically read from your systems, and you do not need to set these parameters. The screen shows a calendar. The week display will depend on the date set in your system clock and the flashing indicating the current date. Since you have not yet set the time and date, the date displayed is probably incorrect.

The description on each item are listed as follows:

DATE :

< Month >, < Date > and <Year >. Ranges for each value are in the CMOS Setup Screen, and the week-day will skip automatically.

TIME :

< Hour >, < Minute >, and < Second >. Use 24 hour clock format, i.e., for PM numbers, add 12 to the hour. For examples, 4: 30 P.M. You should enter the time as 16:30:00.

DRIVE C TYPE / DRIVE D TYPE :

The categories identify the types of hard disk drive C or drive D that have been installed in the computer. There are 45 predefined types and 2 user definable types are for Normal BIOS. Type 1 or Type 45 are predefined. Type User is user-definable.

Press PgUp / <+> or PgDn / <-> to select a numbered hard disk type or type the number and press < Enter >. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.

If you select Type User, related information is asked to be entered to the following items. Enter the information directly from the keyboard and press < Enter >. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is ESDI, the selection shall be "Type 1".

If the controller of HDD interface is SCSI, the selection shall be "None"
If the controller of HDD interface is CD-ROM, the selection shall be "None"

CYLS. :

This is the number of cylinders found in the specified disk drive.

HEADS :

This is the number of heads found in the specified drive type.

PRECOMP :

Precomp the read delay circuitry which takes into account the timing differences between the inner and outer edges of the surface of the disk platter. The number designates the starting cylinder of the signal.

LANDZONE :

Landzone is the landing zone of the heads. This number determines the cylinder location where the heads will normally park when the system is shut down.

SECTORS :

This is the number of sectors per track.

DRIVE A AND DRIVE B :

Select the correct specifications for the diskette drive(s) installed in the computer. The Available option are ❶360KB 5.25in ❷1.2KB 5.25in ❸720KB 3.5in ❹1.44MB 3.5in ❺2.88MB 3.5in and ❻None. Not Installed could be used as an option for diskless workstations.

VIDEO :

This category selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you don‘t have to select the type in Setup. The available options are ❶Mono, ❷EGA/VGA, ❸CGA40, and ❹CGA 80.

HALT ON :

This category determines whether the computer will stop if a hardware error is detected during POST. The available options are ❶ No Errors ❷ All Errors ❸ All, But Keyboard ❹ All, But Diskette❺ All, But Disk/Key.

HARD DISK ATTRIBUTES:

Type	Cylinders	Heads	V-P comp	LZone	Sect	Capacity
1	306	4	128	305	17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	30
4	940	8	512	940	17	62
5	940	6	512	940	17	46
6	615	4	65535	615	17	20
7	642	8	256	511	17	30
8	733	5	65535	733	17	30
9	900	15	65535	901	17	112
10	820	3	65535	820	17	20
11	855	5	65535	855	17	35
12	855	7	65535	855	17	49
13	306	8	128	319	17	20
14	733	7	65535	733	17	42
15	000	0	0000	000	00	00
16	612	4	0000	663	17	20
17	977	5	300	977	17	40
18	977	7	65535	977	17	56
19	1024	7	512	1023	17	59
20	733	5	300	732	17	30
21	733	7	300	732	17	42
22	733	5	300	733	17	30
23	306	4	0000	336	17	10
24	977	5	65535	976	17	40
25	1024	9	65535	1023	17	76
26	1224	7	65535	1223	17	71
27	1224	11	65535	1223	17	111
28	1224	15	65535	1223	17	152
29	1024	8	65535	1023	17	68
30	1024	11	65535	1023	17	93
31	918	11	65535	1023	17	83
32	925	9	65535	926	17	69
33	1024	10	65535	1023	17	85
34	1024	12	65535	1023	17	102
35	1024	13	65535	1023	17	110
36	1024	14	65535	1023	17	119
37	1024	2	65535	1023	17	17
38	1024	16	65535	1023	17	136
39	918	15	65535	1023	17	114
40	820	6	65535	820	17	40
41	1024	5	65535	1023	17	42
42	1024	5	65535	1023	26	65
43	809	6	65535	852	17	40
44	809	6	65535	852	26	61
45	776	8	65335	775	33	100
47			AUTO			

Award Hard Disk Type Table

5-4 The BIOS FEATURES SETUP MENU

Choose the "BIOS FEATURES SETUP" in the main menu, the screen shown as below.

ROM PCI/ISA BIOS (2A5KFP6H)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
External Cache	: Enabled	CC000-CFFFF Shadow	: Disabled
Quick Power On Self Test	: Disabled	D0000-D3FFF Shadow	: Disabled
Boot Sequence	: A,C	D4000-D7FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D8000- DBFFF Shadow	: Disabled
Boot Up Floppy Seek	: Enabled	DC000-DFFFF Shadow	: Disabled
Boot Up Numlock Status	: On		
Boot Up System Speed	: High		
Gate A20 Option	: Fast		
Memory Parity Check	: Disabled		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250	Esc : Quit	↑↓→← : Select Item
Security Option	: Setup	F1 : Help	Pu/Pd/+/- : Modify
PS/2 mouse function control	: Enabled	F5 : Old Values	(Shift)F2 : Color
PCI/VGA Pallete Snoop	: Disabled	F6 : Load BIOS Defaults	
OS Select For DRAM>64MB	: Non-OS2	F7 : Load Setup Defaults	

BIOS Features Setup

The BIOS FEATURES SETUP allows you find true certain features supported by the chipset and Award BIOS. It also includes support for shadow RAM under which the contents of the ROM BIOS can be copied into memory at boot up, enhancing performance. When you change any of the setting, you may recall the default settings at any time from the main menu.

To get help on each item, highlight the relevant item and press the F1 key. A Windows will appear on your screen detailing the various options available for each item.

A brief introduction of each setting in the BIOS FEATURES SETUP program is given below.

VIRUS WARNING :

When set to enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive for any attempt at modification. If an attempt is made, the BIOS will halt the system and a warning message will appear on screen. Afterwards, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done.

- Many disk diagnostic programs which attempt to access the boot sector table can cause the above warning message. If you will be running such a program, it is recommended that you must disable Virus Protection beforehand.

CPU INTERNAL CACHE / EXTERNAL CACHE:

This two categories speed up memory access.

QUICK POWER ON SELF TEST :

You can enable or disable this item to speed up Power On Self Test (POST) after you power on the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

- We suggest that you normally disable quick POST. It is better to find a problem during POST than lose data during your work.

BOOT SEQUENCE :

You may determines the sequence wherein the system will look first for the disk operating system. The Available option are ❶C, A ❷A, C ❸CDROM, C, A and ❹C, CDROM, A.

SWAP FLOPPY DRIVE :

This field is effective only if the system has two floppy drives. Selecting Enabled assigns physical drive B to logical drive A, and physical drive A to logical drive B.

BOOT UP FLOPPY SEEK :

When Enabled, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360KB floppy drives have 40 tracks; drives with 720 KB, 1.2MB, and 1.44MB capacity all have 80 tracks. Because very few modern Pcs have 40-track floppy drives, we recommend that you set this field to disable to save time.

BOOT UP NUMLOCK STATUS :

Toggle between On or Off to control the state of the NumLock key when the system boots. When toggled On, the numeric keypad generates numbers instead of controlling cursor operation.

BOOT UP SYSTEM SPEED :

Select High to boot at the default CPU speed; select Low to boot at the speed of the AT bus. Some add-in peripherals or old software (such as old games) may require a slow CPU speed.

GATE A20 OPTION :

Gate A20 refers to the way the system addresses memory above 1MB (extended memory). When set to Fast, the system chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to Fast improves system speed, particularly with OS/2 and Windows.

MEMORY PARITY CHECK :

Enable or Disable this item according to whether you wish the system to check the memory parity during boot up or not. If you disable this item even if the BIOS encounters a parity error it will be ignored.

TYPEMATIC RATE SETTING:

Enable this item if you wish to be able to configure the characteristics of your keyboard. Typematic refers to the way in which characters are entered repeatedly if a key is held down. For example, if you press and hold down the "A" key, the letter "a" will repeatedly appear on your screen on your screen until you release the key. This item is disable by default.

TYPEMATIC RATE (CHARS-SEC):

You can use this item to define the typematic rate delay of your keyboard, i.e. the rate at which characters will be repeated when a key held down.

TYPEMATIC DELAY (MSEC):

You can use this item to define the period after which the typematic function become active i.e. how long after you press a key the characters will be repeated.

SECURITY OPTION :

This category allows you to limit access to the system and Setup, or just to Setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

PS/2 MOUSE FUNCTION CONTROL :

If your system has a PS/2 mouse port and you install a serial pointing device, select Disabled.

PCI/VGA PALETTE SNOOP:

This entry enable or disable the system to work with MPEG ISA/VESA VGA Card.

OS SELECT FOR DRAM >64Mb:

This item allows you to access the memory that over 64Mb in OS/2. You may choose OS2 or Non-OS2.

This category allows you to limit access to the system and Setup, or just to Setup. To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

5-5 CHIPSET FEATURE SETUP

Choose the "CHIPSET FEATURES SETUP" from the main menu, the screen shown as below.

ROM PCI/ISA BIOS (2A5KFP6H)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Auto Configuration	: Enabled	Word Merge	: Disabled
AT BUS Clock	: CLK2/4	Byte Merge	: Disabled
Asysc. SRAM Write WS	: X-2-2-2	Fast Back-to-Back	: Disabled
Asysc. SRAM Read WS	: X-3-3-3	PCI Write Burst	: Enabled
EDO Read WS	: X-3-3-3		
Page Mode Read WS	: X-3-3-3		
DRAM Write WS	: X-2-2-2		
CPU to DRAM page Mode	: Disabled		
DRAM Refresh Period	: 120 us		
DRAM Data Integrity Mode	: Parity		
Pipelined Function	: Disabled		
16 Bit ISA I/O Command WS	: 2 Wait		
16 Bit ISA Mem Command WS	: 2 Wait		
Local Memory 15-16M	: Disabled		
Passive Release	: Disabled		
ISA Line Buffer	: Disabled	Esc : Quit	↑↓→← : Select Item
Delay Transaction	: Disabled	F1 : Help	Pu/Pd/+/- : Modify
Primary Frame Buffer	: 2 MB	F5 : Old Values	(Shift)F2 : Color
VGA Frame Buffer	: Enabled	F6 : Load BIOS Defaults	
Linear Merge	: Enabled	F7 : Load Setup Defaults	

Chipset Features Setup

This category allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. By moving the cursor to the desired selection and pressing < F1 > key, the all options for the desired selection will be displayed for choice. User can select the desired option.

AUTO CONFIGURATION :

Pre-defined values for DRAM, cache.. timing according to CPU type & system clock. When this item is enabled, the pre-defined items will become SHOW ONLY.

AT BUS CLOCK :

The chipset generates the ISA bus clock (ATCLK) from an internal division of PCICLK. You can set the speed of the AT bus in terms of a fraction of the CPU clock speed, or at the fixed speed of 7.16 MHz.

ASYSC. SRAM READ/WRITE WS :

Select the correct cycle timing combination for the system board design and SRAM specifications.

EDO READ WS :

Select the correct cycle timing combination for the system board design and EDO DRAM specifications.

PAGE MODE READ WS :

Select the correct cycle timing combination for the system board design and Page Mode DRAM specifications.

CPU TO DRAM PAGE MODE :

When Disabled, the memory controller closes the DRAM page after a DRAM access. When Enabled, the DRAM page remains open until the next access.

DRAM REFRESH PERIOD :

Select the period required to refresh the DRAMs, according to DRAM specifications.

DRAM DATA INTEGRITY MODE :

Select Parity or ECC (Error-correcting code), according to the type of installed DRAM.

PIPELINED FUNCTION :

When Enabled, the controller signals the CPU for a new memory address before all data transfers for the current cycles are complete, resulting in faster performance.

16 BIT ISA I/O COMMAND WS :

Your system quite possibly has much higher performance than some of your input/output (I/O) devices. This means that unless the system is instructed to allow more time, more wait states, for devices to respond, it might think the device has malfunctioned and stop its request for I/O. If all your I/O devices are capable, then disabling this setting could result in greater throughput. Otherwise, data could be lost.

16 BIT ISA MEM COMMAND WS :

When memory is accessed on the ISA bus, the system must allow for the relatively slow speed of the ISA bus. This setting allows you to match the speed of device memory located on the ISA bus with the system ability to read/write to that memory.

LOCAL MEMORY 15-16M :

To increase performance, your system can map slower device memory (usually a device is connected to the slower ISA bus) into much faster local bus memory. It does this by setting aside local memory and transferring the start point from the device memory to the local memory. Use this setting to enable/disable this capability.

PASSIVE RELEASE :

When Enabled, CPU to PCI bus accesses are allowed during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM.

ISA LINE BUFFER :

The PCI to ISA Bridge has an 8-byte bidirectional line buffer for ISA or DMA bus master memory reads from or writes to the PCI bus. When Enabled, an ISA or DMA bus master can prefetch two doublewords to the line buffer for a read cycle.

PRIMARY FRAME BUFFER :

Select a size for the PCI frame buffer. The size of the buffer should not impinge on local memory.

VGA FRAME BUFFER :

When Enabled, any video activity restarts the global timer for Standby mode.

LINEAR MERGE :

When enabled, only consecutive linear addresses can be merged.

WORD MERGE :

This field controls the word-merge feature for frame buffer cycles. When Enabled, the controller checks the eight CPU Byte Enable signals to determine if data words read from the PCI bus by the CPU can be merged.

BYTE MERGE :

This field controls the byte-merge feature for frame buffer cycles. When Enabled, the controller checks the eight CPU Byte Enable signals to determine if data bytes read from the PCI bus by the CPU can be merged.

PCI WRITE BURST :

When Enabled, consecutive PCI write cycles become burst cycles on the PCI bus.

5-6 POWER MANAGEMENT SETUP

Choose the "POWER MANAGEMENT SETUP" option on the main menu, a display will be shown on screen as below :

ROM PCI/ISA BIOS (2A5KFP6H)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management	: Disable	IRQ7	(LPT 1)	: ON
PM Control by APM	: Yes	IRQ8	(RTC Alarm)	: OFF
MODEM Use IRQ	: NA	IRQ9	(IRQ Redir)	: ON
Video Off Option	: Suspend→off	IRQ10	(Reserved)	: OFF
Video Off Method	: DPMS Support	IRQ11	(Reserved)	: OFF
		IRQ12	(PS/2 Mouse)	: ON
** PM Timers **		IRQ13	(Coprocessor)	: OFF
HDD Power Down	: Disable	IRQ14	(Hard Disk)	: ON
Doze Mode	: Disable	IRQ15	(Reserved)	: OFF
Standby Mode	: Disable			
Suspend Mode	: Disable			
** PM Events **				
VGA	: OFF			
DRQ	: ON			
IRQ1 (Keyboard)	: ON	Esc : Quit	↑↓→← :	Select Item
IRQ3 (COM 2)	: ON	F1 : Help	Pu/Pd/+/- :	Modify
IRQ4 (COM 1)	: ON	F5 : Old Values	(Shift)F2 :	Color
IRQ5 (LPT 2)	: ON	F6 : Load BIOS Defaults		
IRQ6 (Floppy Disk)	: ON	F7 : Load Setup Defaults		

Power Management Setup

The Power Management Setup allows you to configure your system to the most effectively save energy while operating in a manner consistent with your own style of computer use. The description on each item are listed as follows:

POWER MANAGEMENT :

This items allows you to select the type (or degree) of power saving and is directly related to Doze Mode, Standby Mode, Suspend Mode, and HDD Power Down. There are four available selections for Power Management, three of which has fixed mode settings:

Disable	No power management.
Min. Power Saving	Min. power management. Doze Mode=1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., & HDD Power Down = 15min.
Max. Power Saving	Max. power management -- Only available for SL CPU's. Doze Mode=1 min, Standby Mode = 1 min., Suspend Mode = 1 min., & HDD Power Down = 1min.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except of HDD Power Down which ranges from 1 min. to 15 min. and disable.

PM CONTROL BY APM :

If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings..

MODEM USE IRQ :

Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

VIDEO OFF METHOD :

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

VIDEO OFF OPTION :

Selects the power-saving modes during which the monitor goes blanked.

Always On	Monitor remains on during power-saving modes
Suspend → Off	Monitor blanked when system enters Suspend mode.
Susp, Stby → Off	Monitor blanked when system enters either Suspen or Standby mode.
All Modes → Off	Monitor blanked when system enters any power saving mode.

HDD POWER DOWN :

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

DOZE MODE :

After the selected period of system inactivity, the CPU clocks runs at slower speed while all other devices still operate at full speed.

STANDBY MODE :

After the selected period of system inactivity, the fixed disk drive and the video shut off while all other devices still operate at full speed.

SUSPEND MODE :

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

5-7 PNP/PCI CONFIGURATION

Choose " PNP/PCI CONFIGURATION" from the main menu, a display will be shown on screen as below:

ROM PCI/ISA BIOS (2A5KFP6H) PNP/PCI CONFIGURATION AWARD SOFTWARE, INC.	
Resources Controlled by : Manual Reset Configuration Data : Disabled	PCI IRQ Actived By : Level PCI IDE IRQ Map To : ISA
	Esc : Quit ↑↓→← : Select Item F1 : Help Pu/Pd/+/- : Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults

PNP/PCI CONFIGURATION

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components.

This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

RESOURCE CONTROLLED BY :

The Award Plug and Play BIOS can automatically configure all the boot and Plug and Play compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them.

RESET CONFIGURATION DATA :

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

PCI IDE IRQ MAT TO :

This field lets you select PCI IDE IRQ mapping or PC AT (ISA) interrupts. If your system does not have one or two PCI IDE connectors on the system, select values according to the type of IDE interface(s) installed in your system (PCI or ISA). Standard ISA interrupts for IDE channels are IRQ14 for primary and IRQ15 secondary.

5-8 LOAD BIOS DEFAULTS

AUTO CONFIGURATION WITH BIOS DEFAULTS

"LOAD BIOS DEFAULTS" loads the default BIOS values. When the diagnostic aid of your system becomes unusable, choose this option and the following message appears :

```
Load BIOS Defaults ( Y / N ) ? N
```

To use the BIOS defaults, change the prompt to "Y" and press < Enter >, the CMOS is load automatically when you power on the PC-586HVE-S.

5-9 LOAD SETUP DEFAULTS

AUTO CONFIGURATION WITH SETUP DEFAULTS

This Main Menu item uses the default SETUP values. Use this option as a diagnostic aid of your system behaves erratically. Choose this item and the following message appears:

```
Load SETUP Defaults (Y/N)?N
```

To use the SETUP defaults, change the prompt to "Y" and press <Enter> The CMOS is load automatically form SETUP default values:

5-10 INTEGRATED PERIPHERALS

Choose the "INTEGRATED PERIPHERALS" from the main menu, a display will be shown on screen as below:

ROM PCI/ISA BIOS (2A5KFP6H)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

On-Chip IDE Controller	: Enabled	Onboard Parallel Port	: 378/IRQ7
The 2nd Channel IDE	: Enabled	Parallel Port Mode	: Normal
IDE Primary Master PIO	: Auto		
IDE Primary Slave PIO	: Auto		
IDE Primary Master FIFO	: Disabled		
IDE Primary Slave FIFO	: Disabled		
IDE HDD Block Mode	: Enabled		
On-Chip USB Controller	: Enabled		
USB Keyboard Support	: Disabled	Esc : Quit	↑↓→← : Select Item
		F1 : Help	Pu/Pd/+/- : Modify
Onboard FDC Controller	: Enabled	F5 : Old Values	(Shift)F2 : Color
Onboard UART 1	: 3F8/IRQ4	F6 : Load BIOS Defaults	
Onboard UART 2	: 2F8/IRQ3	F7 : Load Setup Defaults	

INTEGRATED PERIPHERALS

By moving the cursor to the desired selection and pressing the <F1> key, all options for the desired selection will be displayed for choice. User may select the desired option. Having made all the setting according to your selections. Press <Esc> to return to the Main Menu.

ON-CHIP IDE CONTROLLER :

The integrated peripheral controller contains a IDE interface with support for two IDE channels. Select Enabled to activate the IDE interface.

IDE PRIMARY MASTER/SLAVE PIO :

The IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the IDE devices that the onboard IDE interface supports. Mode 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

IDE HDD BLOCK MODE :

Block mode is also called block tranfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

ON-CHIP USB CONTROLLER :

Select enabled if your system contains a Universal Serial Bus (USB) controller.

USB KEYBOAR SUPPORT :

Select enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

ONBOARD FDC CONTROLLER :

Select enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install add-in FDC or the system has no floppy drive, select disabled in this field.

5-11 PASSWORD SETTING

You may choose to select to set either supervisor or user password, or both of them. The differences is that the supervisor password can enter and change options of the setup menus while user password can only enter setup menu but does not have any rights to change any settings.

TO SET A PASSWORD

If you want to enable this item you should choose the 〝PASSWORD SETTING〞 option from the main menu, the following message will appear at the center of the screen to assist you in creating a password.

Enter Password:

Type the password up to eight characters, and press the < Enter > key. You will be asked to confirm the password. Type the password again and press < Enter >. You may also press < Esc > to abort the selection and not enter a password.

To change the original password, enter CMOS setup Menu again, you will be asked to enter the original password, then select "PASSWORD SETTING" and press enter. The system will asked you to enter a password, then you may enter new password and re-type new password for confirmation.

🔔 User should bear in mind that when a password is set, you will be ask to enter the password whenever you enter CMOS setup Menu. This can prevent an unauthorized person from changing any part of your system configuration.

You may determine when the password is required within the BIOS Features Setup Menu and its Security Option. If the Security Option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

TO DISABLE THE PASSWORD

Upon entering the CMOS setup Menu, the system will ask you to enter the original password. Type the original password, select "PASSWORD SETTING" and you will be prompted to enter a password. Instead of typing a new password, press the enter key and a message will appear at the center of the screen.

Password Disabled!!! Press any key to continue...

Press < Enter > and the password will be disabled. Once the password is disabled, you can enter Setup freely.

5-12 IDE HDD AUTO DETECTION

Choose the "IDE HDD AUTO DETECTION" option . The screen will be shown as below.

ROM PCI / ISA BIOS (2A5KFP6H)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

		CYLS.	HEADS	PRECOMP	LANDZONE	SECTORS	MODE
Drive C : (	Mb)	0	0	0	0	0	-------

Select Drive C Option (N=Skip) : N

Option	Size	Cyls	Heads	Precomp	Landzone	Sectors	Mode
2 (Y)	3224	781	128	0	6252	63	LBA
1	3227	6253	16	65535	6252	63	NORMAL
3	3224	781	128	65535	6252	63	LARGE

Note: Some Oses (like SCO-UNIX) must use “Normal” for installation
Esc : Skip

IDE HDD AUTO DETECTION SCREEN

AUTO DETECTION

BIOS setup will display all possible modes that supported by the HDD including NORMAL, LBA, & LARGE.

If HDD does not support LBA mode, ‘LBA’ option will be shown.

If no of cylinders is less then or equal to 1024, no ‘LARGE’ option will be shown.

User can select a mode which is appropriate for then.

HDD MODE

The Award BIOS supports 3 HDD mode: NORMAL, LBA, & LARGE

NORMAL mode:
Generic access mode in which neither the BIOS nor the IDE controller will make any transformations during accessing.

The maximum number of cylinders, heads & sectors for NORMAL mode are 1024, 16, &63.

	no. Cylinder	(1024)
x	no. Head	(16)
x	no. Sector	(63)
x	no. Per sector	(512)
	Total:	528 Mega byte

If user set his HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that.

LBA (logical Block Addressing) mode:
A new HDD accessing method to overcome the 528 Megabyte bottleneck. The number of cylinders. head & sectors shown in setup may not be the number physically contained in the HDD.

During HDD accessing, The IDE controller will transform the logical address described by sector, head & cylinder number into its own physical address inside the HDD.

The maximum HDD size supported by LBA mode is 136 Gigabyte.

LARGE mode:
Some IDE HDDs contain more than 1024 cylinder without LBA support (in some cases, user do not want LBA). The BIOS provides another alternative to support these kinds of HDD.

CYLS	HEADS	SECTOR	MODE
1120	16	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS (or other OS) that the number of cylinder is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside INT 13h in order to access the right HDD address the right HDD address.

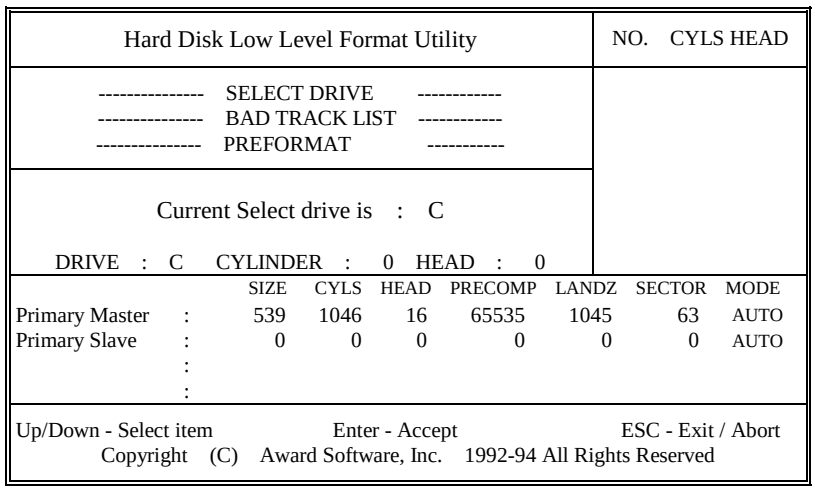
Maximum HDD size:

	no. Cylinder	(1024)
x	no. Head	(32)
x	no. Sector	(63)
x	no. Per sector	(512)
Total:	1	Giga byte

REMARKS:
To support LBA or LARGE mode of HDDs, there must be some softwares involved. All these softwares are located in the Award HDD Service Routine (INT 13h). It may be failed to access a HDD with LBA(LARGE) mode selected if you are running under a Operating System which replaces the whole INT 13h.

5-13 HDD LOW LEVEL FORMAT

Choose the " INTEGRATED PERIPHERALS " from the main menu, a display will be shown on screen as below:

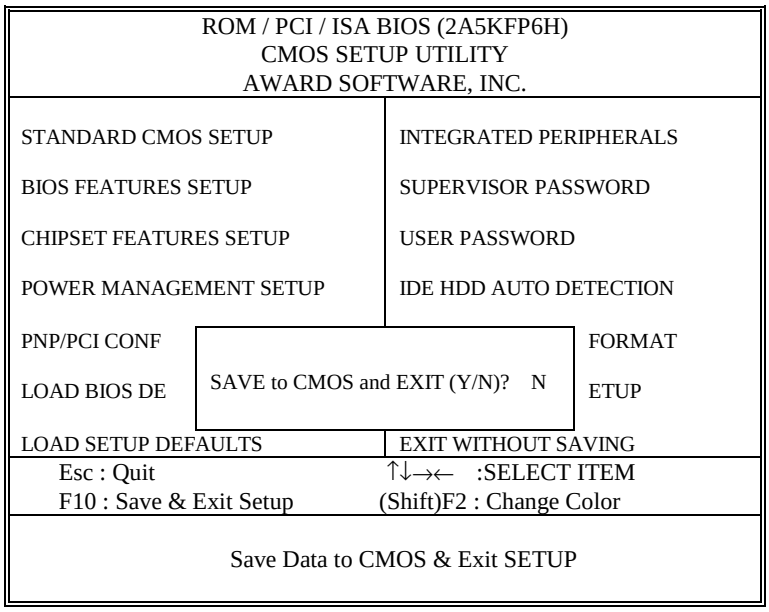


HDD LOW LEVEL FORMAT

By moving cursor to the desired selection and pressing the <F1> key, all options for the desired selection will be displayed for choice. User has to use select the desired option. Having made all the setting according to your selections. Press <Esc> to return to the Main Menu.

5-14 SAVE & EXIT SETUP

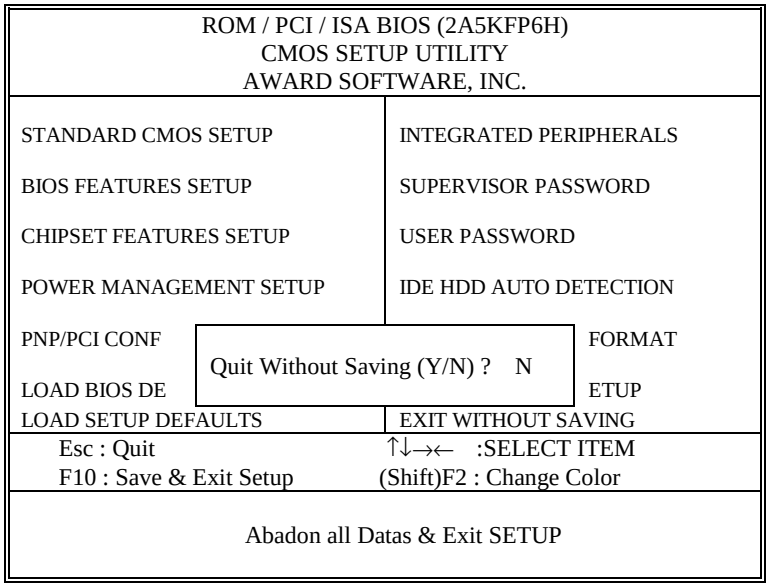
When you have completed adjusting all the settings as required, you must remember to save these settings into the CMOS RAM. Select " SAVE & EXIT " and press <Enter>, as the display shown on below:



After confirmation, your machine will automatically reboot and the changes you have made will be fully implemented. You may call up the setup program at any time to adjust any of the individual items by pressing the <Del> key during boot up.

5-15 EXIT WITHOUT SAVING

If wish to cancel any changes you have made, select "EXIT WITHOUT SAVING" and the original setting stored in the CMOS will be retained. The screen will be shown as below:



EXPANSION BUS

APPENDIX

A

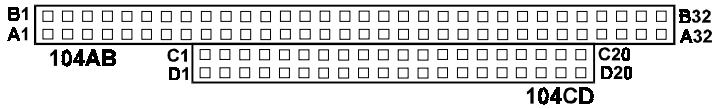
This appendix indicates you the pin assignments.

Section includes:

- PC-104 Connector Pin Assignment
- PCI BUS Pin Assignment

PC-104 CONNECTOR PIN ASSIGNMENT

104AB, 104CD : PC-104 Connector



The PC-104 can support multi-pieces of PC-104 modules. This card has two connectors : one (104AB) consists of 64 pin; the other one (104CD) consists of 40 pin, both of them are dual-in-line headers

The pin assignments for connector 104AB & 104CD are as follow:

104AB				104CD			
PIN	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**	**PIN**	**ASSIGNMENT**
A1	IOCHK	B1	GND	C1	GND	D1	GND
A2	D7	B2	REST	C2	SBHE	D2	MEMCS16
A3	D6	B3	VCC	C3	LA23	D3	IOCS16
A4	D5	B4	IRQ9	C4	LA22	D4	IRQ10
A5	D4	B5	-5V	C5	LA21	D5	IRQ11
A6	D3	B6	DRQ2	C6	LA20	D6	IRQ12
A7	D2	B7	-12V	C7	LA19	D7	IRQ15
A8	D1	B8	OWS	C8	LA18	D8	IRQ14
A9	D0	B9	+12V	C9	LA17	D9	DACK0
A10	IOCHRDY	B10	GND	C10	MEMR	D10	DRQ0
A11	AEN	B11	SMEMW	C11	MEMW	D11	DACK5
A12	A19	B12	SMEMR	C12	D8	D12	DRQ5
A13	A18	B13	IOW	C13	D9	D13	DACK6
A14	A17	B14	IOR	C14	D10	D14	DRQ6
A15	A16	B15	DACK3	C15	D11	D15	DACK7
A16	A15	B16	DRQ3	C16	D12	D16	DRQ7
A17	A14	B17	DACK1	C17	D13	D17	VCC
A18	A13	B18	DRQ1	C18	D14	D18	MASTER
A19	A12	B19	REFRESH	C19	D15	D19	GND
A20	A11	B20	CLK	C20	KEY PIN	D20	GND
A21	A10	B21	IRQ7				
A22	A9	B22	IRQ6				
A23	A8	B23	IRQ5				
A24	A7	B24	IRQ4				
A25	A6	B25	IRQ3				
A26	A5	B26	DACK2				
A27	A4	B27	TC				
A28	A3	B28	BALE				
A29	A2	B29	VCC				
A30	A1	B30	OSC				
A31	A0	B31	GND				
A32	GND	B32	GND				

PCI BUS PIN ASSIGNMENT

The PCI BUS for this card is called “Gold Fingers“. It is divided into two sets : one consists of 98 pins; the other consists of 22 pins.

The pin assignments are as follow :

F		E		F		E	
PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT	PIN	ASSIGNMENT
F1	-12V	E1	TRST#	F31	+3.3V	E31	AD18
F2	TCK	E2	+12V	F32	AD17	E32	AD16
F3	GND	E3	TMS	F33	C/BE2#	E33	+3.3V
F4	TDO	E4	TDI	F34	GND	E34	FRAME#
F5	+5V	E5	+5V	F35	IRDY#	E35	GND
F6	+5V	E6	INTA#	F36	+3.3V	E36	TRDY#
F7	INTB#	E7	INTC#	F37	DEVSEL#	E37	GND
F8	INTD#	E8	+5V	F38	GND	E38	STOP#
F9	REQ3#	E9	CLKC	F39	LOCK#	E39	+3.3V
F10	REQ1#	E10	+5V(I/O)	F40	PERR#	E40	SDONE
F11	GNT3#	E11	CLKD	F41	+3.3V	E41	SB0#
F12	GND	E12	GND	F42	SERR#	E42	GND
F13	GND	E13	GND	F43	+3.3V	E43	PAR
F14	CLKA	E14	GNT1#	F44	C/BE1#	E44	AD15
F15	GND	E15	RST#	F45	AD14	E45	+3.3V
F16	CLKB	E16	+5V(I/O)	F46	GND	E46	AD13
F17	GND	E17	GNT0#	F47	AD12	E47	AD11
F18	REQ0#	E18	GND	F48	AD10	E48	GND
F19	+5V(I/O)	E19	REQ2#	F49	GND	E49	AD09
F20	AD31	E20	AD30	F52	AD08	E52	C/BE0#
F21	AD29	E21	+3.3V	F53	AD07	E53	+3.3V
F22	GND	E22	AD28	F54	+3.3V	E54	AD06
F23	AD27	E23	AD26	F55	AD05	E55	AD04
F24	AD25	E24	GND	F56	AD03	E56	GND
F25	+3.3V	E25	AD24	F57	GND	E57	AD02
F26	C/BE3#	E26	GNT2#	F58	AD01	E58	AD00
F27	AD23	E27	+3.3V	F59	+5V(I/O)	E59	+5V(I/O)
F28	GND	E28	AD22	F60	ACK64#	E60	REQ64#
F29	AD21	E29	AD20	F61	+5V	E61	+5V
F30	AD19	E30	GND	F62	+5V	E62	+5V

TECHNICAL SUMMARY

APPENDIX

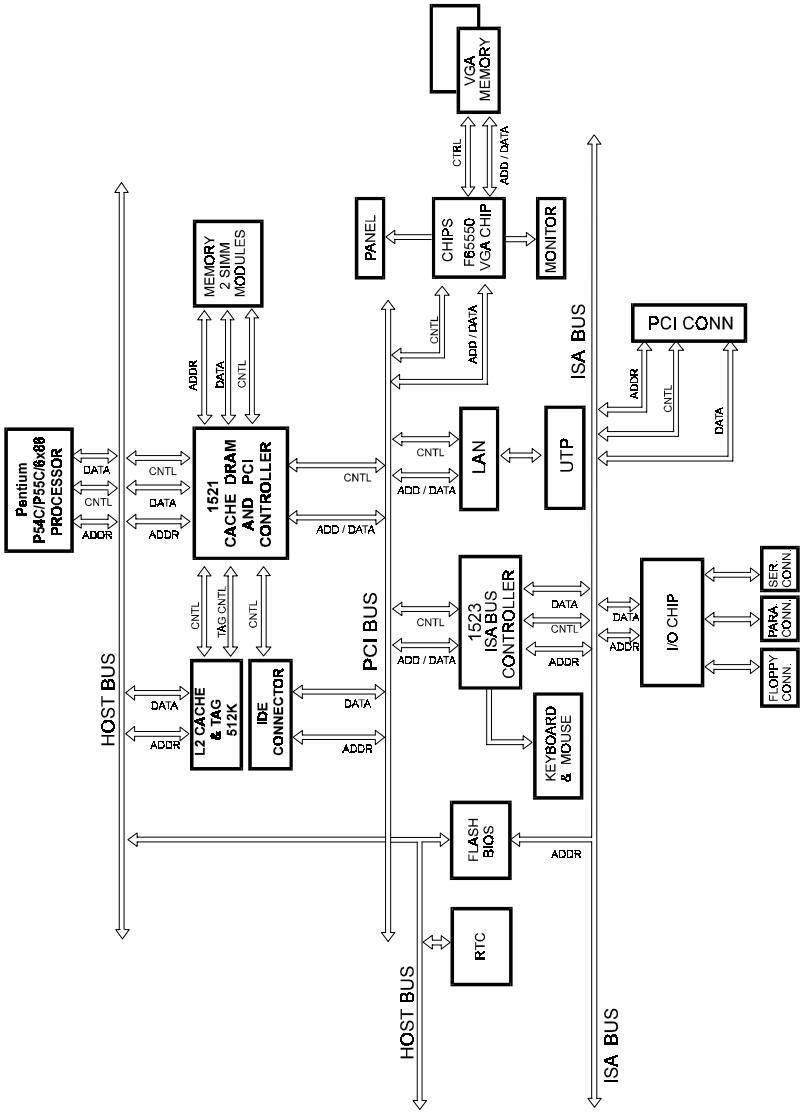
B

This section introduce you the maps concisely.

Sections include:

- Block Diagram
- Interrupt Map
- RTC & CMOS RAM Map
- Timer & DMA Channels Map
- I / O & Memory Map

BLOCK DIAGRAM



INTERRUPT MAP

IRQ	ASSIGNMENT
0	System TIMER interrupt from TIMER-0
1	Keyboard output buffer full
2	Cascade for IRQ 8-15
3	Serial port 2
4	Serial port 1
5	Parallel port 2
6	Floppy Disk adapter
7	Parallel port 1
8	RTC clock
9	Available
10	Available
11	Available
12	Available
13	Math coprocessor
14	Hard Disk adapter
15	Available

RTC & CMOS RAM MAP

CODE	ASSIGNMENT
00	Seconds
01	Second alarm
02	Minutes
03	Minutes alarm
04	Hours
05	Hours alarm
06	Day of week
07	Day of month
08	Month
09	Year
0A	Status register A
0B	Status register B
0C	Status register C
0D	Status register D
0E	Diagnostic status byte
0F	Shutdown byte
10	Floppy Disk drive type byte
11	Reserve
12	Hard Disk type byte
13	Reserve
14	Equipment byte
15	Base memory low byte
16	Base memory high byte
17	Extension memory low byte
18	Extension memory high byte
30	Reserved for extension memory low byte
31	Reserved for extension memory high byte
32	Date Century byte
33	Information Flag
34-3F	Reserve
40-7f	Reserved for Chipset Setting Data

TIMER & DMA CHANNELS MAP

Timer Channel Map :

Timer Channel	Assignment
0	System timer interrupt
1	DRAM Refresh request
2	Speaker tone generator

DMA Channel Map :

DMA Channel	Assignment
0	Available
1	IBM SDLC
2	Floppy Disk adapter
3	Channel-3 Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

I/O & MEMORY MAP

Memory Map :

MEMORY MAP	ASSIGNMENT
0000000-009FFFF	System memory used by DOS and application
00A0000-00BFFFF	Display buffer memory for VGA/ EGA / CGA / MONOCHROME adapter
00C0000-00DFFFF	Reserved for I/O device BIOS ROM or RAM buffer.
00E0000-00EFFFF	Reserved for PCI device ROM
00F0000-00FFFFF	System BIOS ROM
0100000-BFFFFFF	System extension memory

I/O Map :

I/O MAP	ASSIGNMENT
000-01F	DMA controller (Master)
020-021	Interrupt controller (Master)
022-023	Chipset controller registers I/O ports.
040-05F	Timer control regsiters.
060-06F	Keyboard interface controller (8042)
070-07F	RTC ports & CMOS I/O ports
080-09F	DMA register
0A0-0BF	Interrupt controller (Slave)
0C0-0DF	DMA controller (Slave)
0F0-0FF	Math coprocessor
1F0-1F8	Hard Disk controller
278-27F	Parallel port-2
2B0-2DF	Graphics adapter controller
2F8-2FF	Serial port-2
360-36F	Net work ports
378-37F	Parallel port-1
3B0-3BF	Monochrome & Printer adapter
3C0-3CF	EGA adapter
3D0-3DF	CGA adapter
3F0-3F7	Floppy disk controller
3F8-3FF	Serial port-1

TROUBLE SHOOTING

APPENDIX

C

This section outlines the errors messages that may occur when you operate the system. It also provides some suggestions on solving the problem.

Sections include:

- Trouble Shooting for Error Messages
- Trouble Shooting for POST Code

C-1 TROUBLE SHOOTING FOR ERROR MESSAGE

The following information inform you the error messages and the trouble shooting. Please adjust your systems according to the messages below. And make sure all the components and connectors are in proper position and firmly attached. If the errors still encountered, please contact with your distributor for maintenance.

POST BEEP :

Currently there are two kind of beep codes in BIOS. The one code in-dicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code con-sists of a single long beep followed by three short beeps. The other one code indicates that your DRAM error has occurred. This beep code consists of a single long beep repeatedly.

CMOS BATTERY FAILURE :

When the CMOS battery is out of work or has run out, the user has to replace the whole unit.

CMOS CHECKSUM ERROR :

This error inform you that the CMOS is corrupted. When the battery runs weak, this situation might happen. Please check the battery and change a new one when necessary.

DISPLAY SWITCH IS SET INCORRECTLY :

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the video selection.

DISK BOOT FAILURE:

When you can‘t find the boot device, insert a system disk into Drive A and press < Enter >. Make sure both the controller and cables are all in proper positions, also make sure the disk is formatted correct device. Then reboot the system.

DISKETTE DRIVES OR TYPES MISMATCH ERROR :

When the diskette drive type is different from CMOS, please run setup or configure the drive again.

ERROR ENCOUNTERED INITIALIZING HARD DRIVE :

When you can‘t initialize the hard drive. Assure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

ERROR INITIALIZING HARD DISK CONTROLLER :

When this error occurs. Be sure the cord is exactly installed in the bus. Make sure the correct hard drive type is selected in Setup. Also check whether all of the jumpers are set correctly in the hard drive.

FLOPPY DISK CONTROLLER ERROR OR NO CONTROLLER PRESENT :

When you cannot find or initialize the floppy drive controller, please check the controller whether in proper Setup. If there are no floppy drive installed, Ensure the Diskette Drive selection in Setup is set to NONE.

KEYBOARD ERROR OR NO KEYBOARD PRESENT :

When this situation happens, please check keyboard attachment and no keys being pressed during the boot. If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

MEMORY ADDRESS ERROR :

When the memory address indicates error. You can use this location along with the memory map for your system to find and replace the bad memory chips.

MEMORY SIZE HAS CHANGED :

Memory has been added or removed since the last boot. In EISA mode use Configuration Utility to re-configure the memory configuration. In ISA mode enter Setup and enter the new memory size in the memory fields.

MEMORY VERIFYING ERROR :

It indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.

OFFENDING ADDRESS MISSING :

This message is used in connection with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

REBOOT ERROR :

When this error occurs that requires you to reboot.. Press any key and the system will reboot.

SYSTEM HALTED :

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

C-2 TROUBLE SHOOTING FOR POST CODES

When you power on your PC, and the screen display nothing. You have to insert the POST Card for test. The address for ISA POST port is 80h. Make sure the card is in correct slot. The lists below indicate you the error messages. Please follow the instruction to adjust your system. If the error still occurred, please contact with your distributor for maintenance.

C0 : Turn off OEM specific cache, shadow.....

03 : Initialize all the standard devices with default values Standard devices includes :
DMA controller (8237).
Programmable Interrupt Controller (8259).
Programmable Interval Timer (8254).
RTC chip.

05 : 1.Keyboard Controller Self-Test.
2.Enable Keyboard Interface.

07 : Verfies CMOS‘s basic R/W functionality.

BE : Program defaults values into chipset according to the MODBINable Chipset Default Table.

C1 : Auto-detection of onboard DRAM & Cache.

C5 : Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster.

08 : Test the first 256K DRAM.

09 : 1. Program the configuration register of Cyrix CPU according to the MODBINable Cyrix Register Table.
2. OEM specific cache initialization (if needed).

0A : 1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers
Initialize INT no from 33-120 with Dummy(Spurious) Interrupt Handler.
2. Issue CPUID instruction to identify CPU type.
3. Early Power Management initialization (OEM specific).

0B : 1.Verify the RTC time is valid or not.
2. Detect bad battery.
3. Read CMOS data into BIOS stack area.
4. PnP initializations including (PnP BIOS only).
-Assign CSN to PnP ISA card.
-Create resource map from ESCD.
5. Assign I/O & Memory for PCI devices (PCI BIOS only).

0C : Initialization of the BIOS Data Area (40 : 0N-40:FF).

0D : 1. Program some of the Chipset‘s value according to Setup. (Early Setup Value Program).
2. Measure CPU speed for display & decide the system clock speed.
3. Video initialization including Monochrome ,CGA, EGA/VGA. If no display device found, the speaker will beep.

0E : 1. Initialize the APIC (Multi-Processor BIOS only).
2. Test video RAM (If Monochrome display device found).
3. Show messages including :
-Award Logo, Copyright string, BIOS Date code & Part No.
-OEM specific sign on messages.
-Energy Star Loge (Green BIOS only).
-CPU brand, type & speed.
-Test system BIOS checksum (Non-compress Version only).

0F : DMA channel 0 test.

10 : DMA channel 1 test.

11 : DMA page registers test.

14 : Test 8254 Timer 0 Counter2.

15 : Test 8259 interrupt mask bits for channel 1.

16 : Test 8259 interrupt mask bits for channel 2.

19 : Test 8259 functionality.

30 : Detect Base Memory & Extended Memory Size.

31 : 1. Test Base Memory from 256K to 640K.
2. Test Extended Memory from 1M to the top of memory.

32 : 1.Display the Award Plug & Play BIOS Extension message (PnP BIOS only).
2.Program all onboard super I/O chips (if any) including COM ports, LPT ports, FDD port....according to setup value.

3C : Set flag to allow users to enter CMOS Setup Utility.

3D : 1 Initialize Keyboard.
2 Install PS2 mouse.

3E : Try to turn on Level 2 cache.
Note : Some chipset may need to turn on the L2 cache in this stage. But usually, the cache is turn on later in POST 61h.

BF : 1. Program the rest of the Chipset‘s value according to Setup. (Later Setup Value Program).
2. If auto-configuration is enabled, programmed the chipset with pre-defined value in the MODBINable Auto-Table.

41 : Initialize floppy disk drive controller.

42 : Initialize Hard drive controller.

43 : If it is a PnP BIOS, initialize serial & parallel ports.

45 : Initialize math coprocessor.

4E : If there is any error detected (such as video, kb....), show all the error messages the screen & wait for user to press <F1> key.

4F : 1. If password is needed, ask for password.
2. Clear the Energy Star Logo (Green BIOS only).

50 : Write all CMOS values currently in the BIOS stack area back into the CMOS.

52 : 1.Initialize all ISA ROMs.
2. Later PCI initializations (PCI BIOS only).
-assign IRQ to PCI devices.
-initialize all PCI ROMs.
3.PnP Initializations (PnP BIOS only).
-assign I/O, Memory, IRQ & DMA TO PnP ISA devices.
-initialize all PnP ISA ROMs.
4. Program shadows RAM according to Setup settings.
5. Program parity according to Setup setting.
6. Power Management Initialization.
-Enable/Disable global PM.
-APM interface initialization.

53 : 1.If it is NOT a PnP BIOS, initialize serial & parallel ports.
2. Initialize time value in BIOS data area by translate the RTC time value into a timer tick value.

60 : Setup Virus Protection (Boot Sector Protection) functionality according to Setup setting.

61 : 1. Try to turn on Level 2 cache.
Note : if L2 cache is already turned on in POST 3D, this part will be skipped.
2. Set the boot up speed according to Setup setting.
3. Last chance for Chipset initialization.
4. Last chance for Power Management initialization (Green BIOS only).
5. Show the system configuration table.

62 : 1.Setup daylight saving according to Setup value.
2.Program the NumLock, typematic rate & typematic speed according to Setup setting.

63 : 1. If there is any changes in the hardware configuration, update the ESCD information (PnP BIOS only).
2. Clear memory that have been used.
3. Boot system via INT 19H.

FF : System Booting. this means that the BIOS already pass the control right to the operating system.

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